

2-6 Algebraic Proof

Reflexive Property: $a = a$

Symmetric Property: If $b = a$, then $a = b$.

Transitive Property:

If $a = b$ and $b = c$, then $a = c$.

Addition/Subtraction Properties:

If $a = b$, then $a + c = b + c$ and $a - c = b - c$.

Multiplication/Division Properties:

If $a = b$, then $a \cdot c = b \cdot c$ and $\frac{a}{c} = \frac{b}{c}$.

Substitution Property: If $a = b$, then a may replace b in any equation/expression.

Distributive Property:

$$a(b+c) = a \cdot b + a \cdot c$$

ex: $3(x-2) = 42$

$$3x - 6 = 42$$

Distributive Prop.

$$3x - 6 + 6 = 42 + 6$$

Addition Prop. (APOE)

$$3x = 48$$

Substitution

$$\frac{3x}{3} = \frac{48}{3}$$

Division Prop. (DPOE)

$$x = 16$$

Substitution

Reflexive: Segments
 $AB = AB$

Angles
 $m\angle 1 = m\angle 1$

Symmetric: If $CD = EF$,
then $EF = CD$.

If $m\angle 2 = m\angle 3$,
then $m\angle 3 = m\angle 2$.

Transitive: If $GH = IJ$ and $IJ = KL$,
then $GH = KL$.

If $m\angle 4 = m\angle 5$ and $m\angle 5 = m\angle 6$,
then $m\angle 4 = m\angle 6$.

ex: If $m\angle 1 = m\angle 2$ and $m\angle 2 = 90$, then
which of the following is a valid conclusion?

~~a)~~ $m\angle 1 = 45$

b) $m\angle 1 = 90$ using substitution property or transitive property

c) $m\angle 1 + m\angle 2 = 180$

~~d)~~ $m\angle 1 + m\angle 2 = 90$